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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,896	12/27/2005	Masanori Sakai	2342-0140PUS1	2272
2292	7590	12/29/2006		
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER CHANDRA, SATISH	
			ART UNIT	PAPER NUMBER
			1763	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	12/29/2006	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 12/29/2006.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,896	<b>Applicant(s)</b> SAKAI ET AL.	
	<b>Examiner</b> Satish Chandra	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/05.12/05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 4 – 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: Plasma generating device to activate the claimed reaction gases.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Choi et al (US 6,279, 503).**

**Choi et al discloses a substrate processing apparatus comprising:**

A reaction chamber 10 (Fig 2)

An exhaust port 48

A gas supply system for supplying a plurality of reaction gases 24, 26, 30 to the reaction chamber wherein the gas supply system comprises:

A cleaning gas supply unit 30

A post-processing gas supply unit 24 and 26 wherein the post-processing gas includes all the reaction gases used when the substrate is subjected to the desired processing.

**Claims 1 –3, 8 and 9 are rejected under 35 U.S.C. 102 (e) as being anticipated by Saito et al (US 2002/0073923).**

**Saito et al discloses a substrate processing apparatus comprising:**

A reaction chamber 11 (Fig 1)

An exhaust port 61 (Para 0099) for exhausting gases from the reaction chamber

A gas supply system 35a, 35b, 35c and 35d for supplying at least a plurality of reaction gases (such as DCS,  $\text{SiH}_2\text{Cl}_2$  and ammonia, Para 0093, 0094) to the reaction chamber wherein the gas supply system comprises:

A cleaning gas supply unit, 35d (Para 0097) for supplying cleaning gas (such as HF, Para 0097) to the reaction chamber

Post-processing gas supply units (reaction gas supply units) 35a, 35b for supplying post processing gas through the gas supply pipes (nozzles) 31a, 31b, 31c in the reaction chamber (Paras 0093, 0094, 0095 and 0097) wherein each of the reaction gases supplied from the post processing gas supply units remove the element remaining in the exclusive supply nozzles and the reaction chamber and form a desired film in the reaction chamber.

A controller 75 controls the function of all the valves 35a to 35d, 36a and 36b and controls the temperature of each part of the apparatus (Paras 0122, 0124)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 4 – 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 2002/0073923) in view of Okuda et al (US 2003/0024477).**

**Saito et al was discussed above and further teaches:**

Cleaning gas (source 35 d, fig 1) is a gas (HF) containing fluorine and the gas including silicon is the first gas DCS ( $\text{SiH}_2\text{Cl}_2$ , Para 0093).

**Saito et al does not teach:**

A plasma unit for exciting gases in the chamber.

**Okuda et al teaches:**

A plasma-producing unit 17 (Fig1), which is provided at one side of the lower portion of the reaction tube 12 to produce plasma of the reaction gases.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a plasma producing unit in the apparatus of Saito et al as taught by Okuda et al.

The motivation of providing a plasma producing unit in the apparatus of Saito et al is to provide a means to excite the reaction gases as taught by Okuda et al.

**Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 2002/0073923) and Okuda et al (US 2003/0024477) as applied to claims 4 –6 and 10 above and further in view of Choi et al (US 6,279, 503).**

**Saito et al and Okuda et al were discussed above.**

**Saito et al and Okuda et al do not teach** if the cleaning gas is NF<sub>3</sub> or ClF<sub>3</sub>.

**Choi et al discloses** ClF<sub>3</sub> as the cleaning gas (Column 4, lines 34 – 37).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use ClF<sub>3</sub> as the cleaning gas in the apparatus of Saito et al and Okuda et al as taught by Choi et al.

The motivation to use ClF<sub>3</sub> gas is that it is an alternate and equivalent gas for cleaning the pipe lines and the chamber walls as taught by Choi et al.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund can be reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Satish Chandra

  
Jeffrie R. Lund

Primary Examiner

SC  
12/16/2006